

Part I. Regridding technique



[Contents](#) [Previous](#) [Next](#)

Goal: The goal for this tutorial is to show how to find out the gridding of the data and to regrid data from one grid onto another grid.

Note: To run the code you need to have access to the data in the directory '`/pcmdi/PCMDI1/obs/`'.

The strategy:

- 1) read the CRU data temperature anomaly data called 'temanom'. This is 5 deg gridded data. Get the grid definition from it and also the lat, lon, time and mask definitions that we will use to create the merged data.
- 2) extract ERA40 data: 2-meter surface air temperature ('tas') and sea surface temperature ('sst'). Regrid the data to the 5 degree grid using the grid from 1).

Lets start with importing all the needed modules, note that we will need the **Regridder** from module **regrid**.

```
# Import modules
import cdms, cdutil, MA, vcs, cdtime
import string, Numeric, time, MV, sys
from regrid import Regridder
```

1) read the CRU data:

```
# Open data file
a=cdms.open('/pcmdi/PCMDI1/obs/tutorial_data/hadcrut2.nc')
print a.listvariable()
```

The output is:

```
['temanom']
```

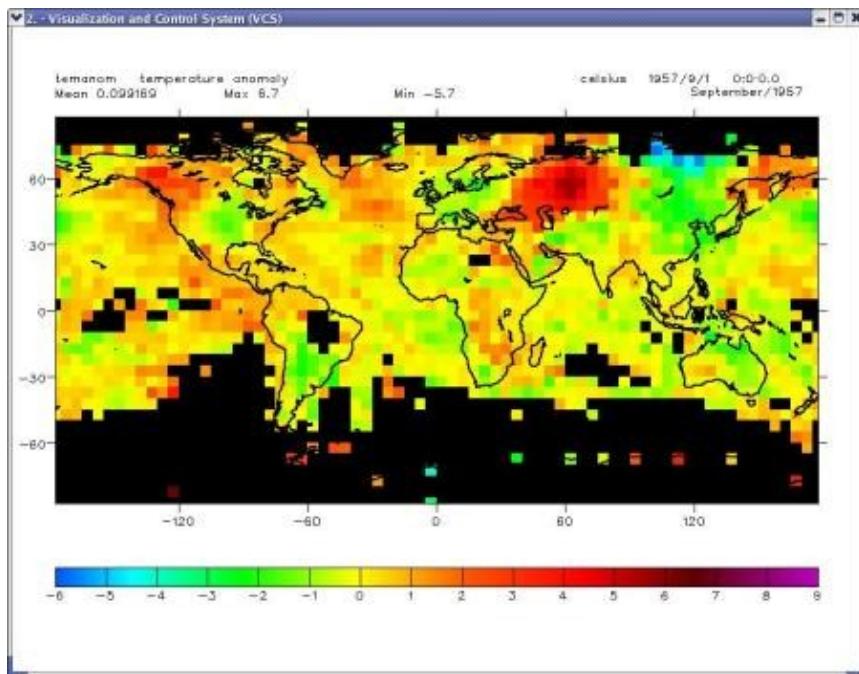
Read the 'temanom' data and display its shape

```
data=a('temanom',time=slice(1220,1760),latitude=(-90,90))
print data.shape
```

```
(540, 36, 72)
```

Use `'print data.info()'` to see full information about this data. Plot data with default settings.

```
x=vcs.init()
x.setcolormap('default')
x.plot(data)
```



Now get the grid, lat, lon and time definitions from that data.

```
# get grid for regridding
grid1=data.getGrid()
# see how it looks like
print grid1.info()

<bound method TransientRectGrid.info of Grid has Python id -0x491e3394.
 Gridtype: generic
 Grid shape: (36, 72)
 Order: yx

# get "spatial missing mask"
mask1=data.mask()
# get metadata for final desired data (e.g. latitudes, longitudes, time)
lat=data.getLatitude()
lon=data.getLongitude()
tim=data.getTime()
# close the file
a.close()
```

2) read ERA40 data

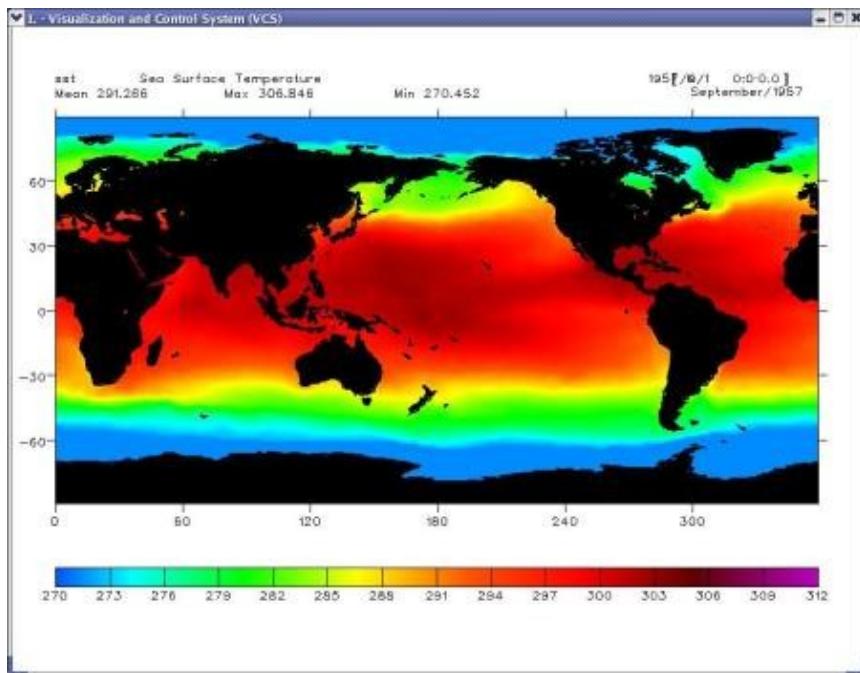
```
# Get the ERA40 data for both 2-meter temperature (tas) and ssts (sst)
# on original grid
b=cdms.open('/pcmdi/PCMDI1/obs/tutorial_data/era40_tas_sst.nc')
# Get data
sst=b('sst')
tas=b('tas')
print sst.shape
```

(540, 160, 320)

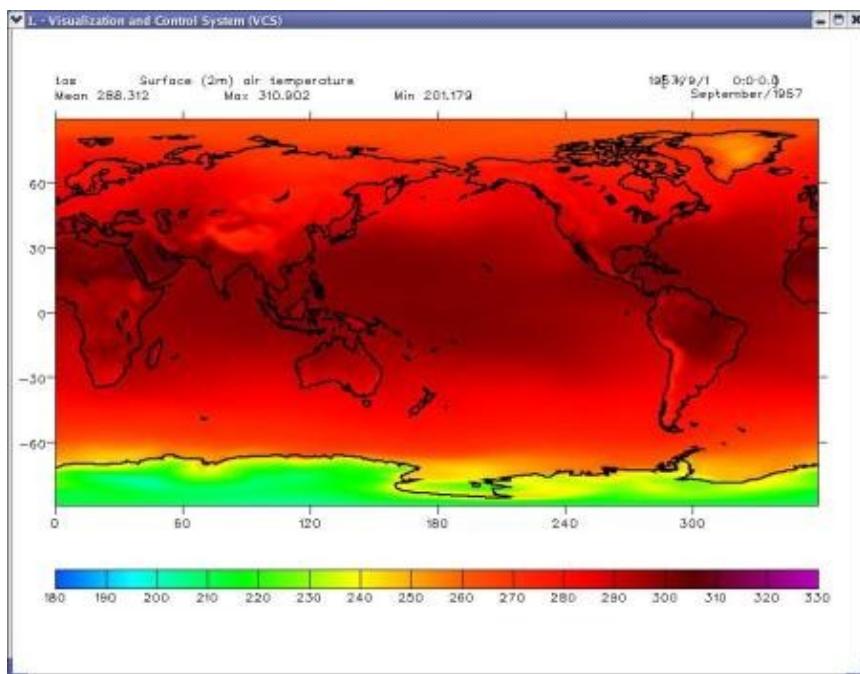
Plot 'sst' and 'tas'

```
x=clear()
```

```
x.plot(sst)
```



```
y=vcs.init()  
y.setcolormap('default')  
y.plot(tas)
```



```
# get grid for regridding  
grid2=sst.grid()  
# close the file  
b.close()
```

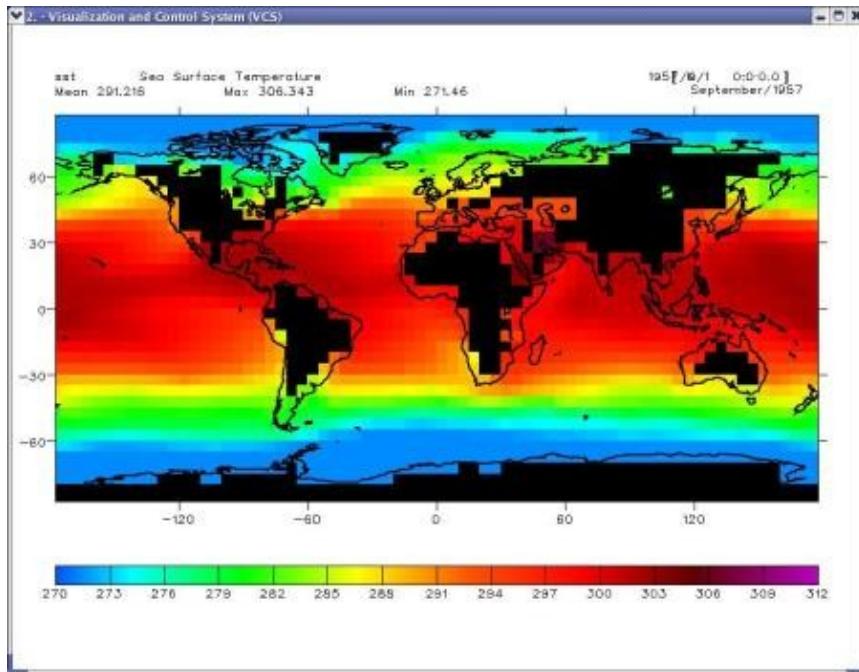
Now lets regrid the 'sst' and 'tas' data to 5-degree grid defined in 1)

```
# setup a regridding function (as: fromgrid, togrid)
```

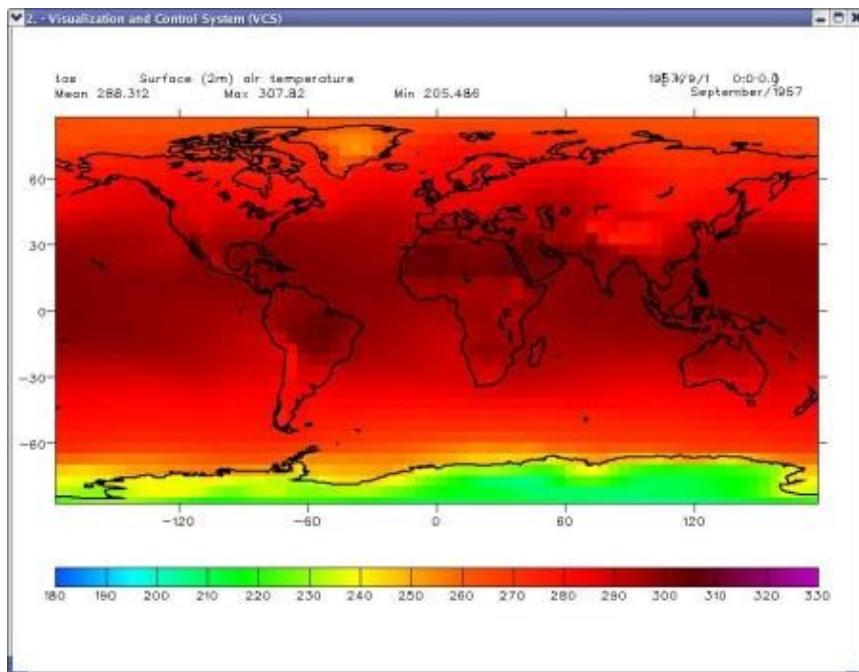
```
regridfunc=Regridder(grid2,grid1)
# create new data with 'togrid' (5-deg) resolution by passing
# the data with 'fromgrid' resolution into the function above
sst_new=regridfunc(sst)
tas_new=regridfunc(tas)
```

Plot 'sst_new' and 'tas_new'

```
x=clear()
x.plot(sst_new)
```



```
y=vcs.init()
y.setcolormap('default')
y.plot(tas_new)
```



next: [Part II. Creating sea/land mask and masked data .](#)

[Contents](#) [Previous](#) [Next](#)